ANCHORING FARMLANDS IN THE OHIO VALLEY REGION

UNITED STATES DEPARTMENT
OF AGRICULTURE
SOIL CONSERVATION SERVICE

FARMLANDS often seem as stable as the Rock of Gibraltar. Yet, within the memory of men now living, land in the Ohio Valley Region has been cleared, tilled, ruined by erosion, and abandoned.

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If the United States is to remain a productive agricultural Nation we must "anchor" our soil and protect it against the ravages of rain and wind. Already we have lost untold billions of tons from millions of acres. The task that lies before us is to check the further advance of erosion and carefully conserve the abundant supply of fertile soil that remains.

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The pages that follow tell the story of soil in the Ohio Valley Region. They show what happens to farmlands treated carelessly and offer, as an alternative, practical measures for soil protection in this rich agricultural section.

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UNITED STATES DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE ▪ REGION THREE

LONG AGES AGO

UNDER primeval conditions, erosion is an age-long process that carves out the channels of rivers and wears down the tops of mountains. Nature, working patiently, builds up rich, fertile soil from the parent rock material at the rate of 1 inch in several hundred years. Shortly after the arrival of man and his civilization, this natural equilibrium is rudely disturbed. Man removes the checks that hold geologic erosion within safe bounds and unleashes the processes of accelerated erosion that riddle the land and strip off the topsoil.

WHEN THE PIONEERS CAME

WHEN the first settlers penetrated the wilderness to the Ohio Valley Region, they found no evidence of accelerated erosion. The foliage was so dense that these early travelers were forced to follow Indian trails or navigable waterways. Leafy branches broke the force of raindrops. Forest litter and spongy soil held most of the rain where it fell. Heavy, matted grasses protected the life-producing topsoil, kept it porous and absorptive.

Erosion was no problem when virgin forest covered the land

AX AND PLOW

VIRGIN conditions were ideal for soil stabilization; but hardly suitable for human habitation. The early settlers lost no time in remaking the landscape for the satisfaction of their vital needs, and in preparing the land for the construction of dwellings and the cultivation of crops. Busily they set to work with ax and plow, clearing the forests from the slopes and breaking the land for the seed.

Before long the rainfall began to run more rapidly off the denuded land and to pick up huge quantities of soil on its way. Eventually the subsoil appeared in places where the swiftly moving waters had washed away the fertile topsoil. Gullies started to form and spread over the countryside. Streams began to flow muddy with the soil from upland farms. Erosional debris piled up on bottom lands and river beds.

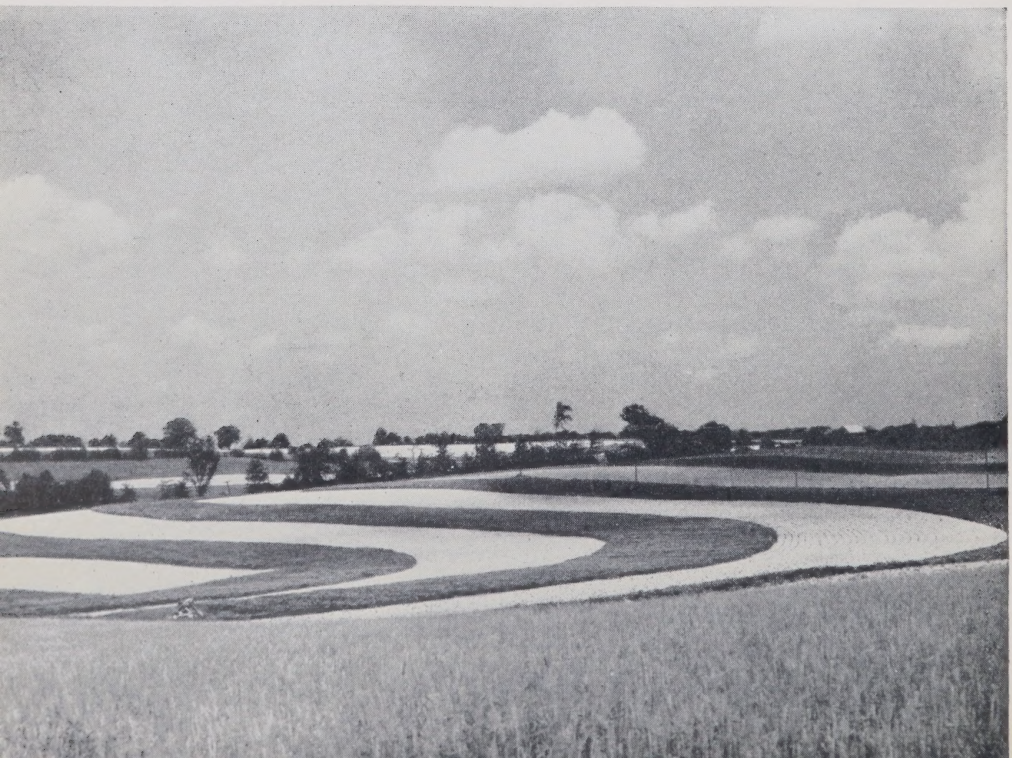
One rain ruined this recently prepared seedbed. Conservation farming could have prevented such damage

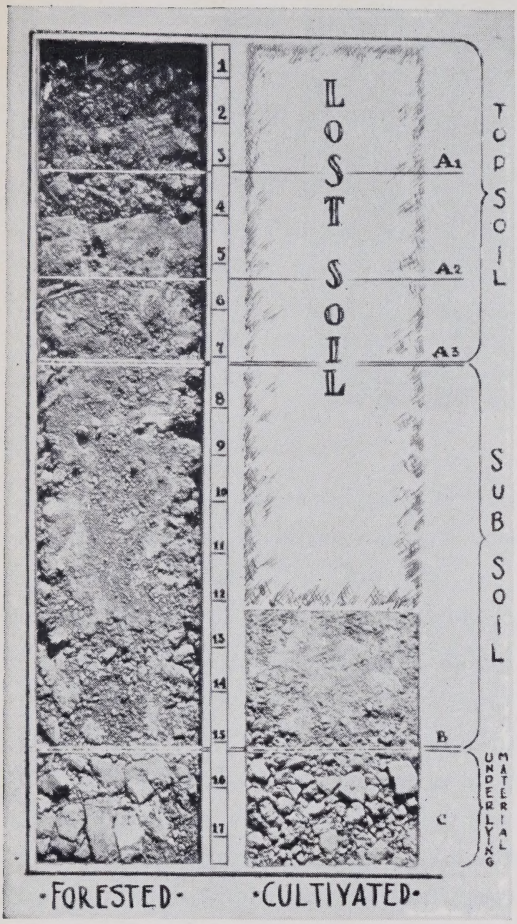
A NEW LANDSCAPE PATTERN

THIS ugly picture even now prevails over far too large a portion of the Ohio Valley Region. But today in many places a new landscape pattern is replacing erosion-scarred hillsides and silted bottom lands. The conservation pattern is not quite like anything previously seen in this region. But it bears a resemblance to nature's original layout.

Essentially, it represents a compromise—a kind of bargain—with nature. It stands as convincing proof that heavy soil losses and decreased fertility are not the inevitable consequence of farming operations. They result, rather, from lack of knowledge or neglect. It was not the mere act of cultivation that brought accelerated erosion to the Ohio Valley Region. It was the careless manner in which so many farmers used the land. Conservation farming aims to gather the bounties of nature without violating certain of her fundamental principles.

The conservation pattern brings crop production into harmony with natural laws





EXAMINE THE SOIL

THE soil is the foundation upon which your cropping system must be built. You cannot erect a skyscraper on shifting sand. Neither can you build a successful cropping system on badly eroded lands or on soils of low productive capacity. If a field has numerous "thin spots", or if subsoil shows in the furrow slice, the soil offers a poor basis for a profitable cropping program.

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Soil profiles from Soil Conservation Experiment Station, Zanesville, Ohio. Approximately a foot of soil lost under continuous cultivation, contrasting with no apparent loss from woodland

RE-PLAN THE FARM

TO BRING cropping and tillage practices into harmony with natural laws the farmer must analyze his farm and classify every portion according to degree of erosion, slope, soil type, and present land use. On the basis of this analysis, and with a due regard for the economic demands of the land, a coordinated soil-conservation plan can be worked out.

Over a long period of years farmers in many sections of the United States and in other lands have developed a number of conservation-farming practices by a slow, gradual process of trial and error. Agricultural scientists have studied these practices, measured their values, and made some helpful improvements.

Rich soil from the hills once fertilized lowlands

TODAY the conservation farmer can draw upon a wide variety of highly developed control measures, each of them adapted to peculiar conditions. For effective protection of the whole farm against erosion, these individual practices must be combined in a comprehensive program of land use. Such a program will include proper crop rotations, fertilization, improved cultural practices, and mechanical structures for cropland; fertilization, contour furrowing, and controlled grazing for pasture land; and the planting, protection, and management of areas turned over to permanent woodlands.

. . . now lowlands are buried under the wash from sterile hills

CROP ROTATIONS

MUCH land in the Ohio Valley Region has been robbed of its fertility and stripped of its topsoil because farmers planted it to soil-depleting crops, such as corn, cotton, and smaller grains year after year with no legumes in the rotation. Clean-tilled crops take up the plant food in the soil and offer scant protection against the erosive effect of run-off waters. Leguminous crops, on the other hand, restore nutrient material to the soil and slow up the movement of water. In other words, by a correct crop rotation the farmer can increase his yields, improve the fertility of his soil, and reduce the effect of erosion.

COVER CROPS

LEFT bare after harvest, sloping fields offer a perfect target for soil erosion. Water rushes unimpeded across them and takes with it a thin layer of topsoil. Fields may be protected during the winter months by sowing them to a well-adapted cover crop. In the Ohio Valley Region the use of small grains, such as rye and wheat, tends to hold the expense of this practice to a minimum. Under normal seasonal conditions such cover crops may also provide some supplemental pasture.

Winter rye sown just after cotton-picking time established this effective cover

FERTILIZING AND LIMING

THE role of the root in erosion control is a highly important one. Roots tend to bind the soil and hold it in place. Stems and stalks above the ground check the progress of flowing water and keep the soil pores open and ready to receive the moisture. Consequently, any agent that promotes better plant development both above and below the surface of the earth constitutes a two-edged attack on the erosion problem. Proper fertilizers are a valuable ally for any farmer bent on conserving his soil. Barnyard manures should be used to the extent of their availability.

Many crops, and particularly the legumes, are ill-adapted to growth on acid soils. To counteract this condition on many fields farmers are applying liming materials as a neutralizing agent. The Soil Conservation Service recommends their use on acid soils as a means of improving the quality and abundance of vegetative cover.

Applying lime in a terrace channel with trailer-type spreader

Rows up and down the slope. Each middle becomes a channel for hurrying water off the land with a maximum loss of soil

CONTOUR CULTIVATION

UNDERLYING much erosion-control theory and practice is one simple principle of physics. The amount of soil which flowing water can pick up and carry depends largely on the speed with which it moves. All other things being equal, it is the swift water that does the damage.

When a farmer plows straight up and down a sloping field, he creates an ideal condition for hurrying rainfall into the lowlands. Each furrow acts as a channel for the rapid discharge of water. By tilling his fields on the contour, or true level of the land, the farmer places a whole series of miniature dams across the path of the moving water, impeding its progress and promoting its absorption by the soil.

Each row on the exact contour, ready to hold back the rainfall and make it sink into the soil

CONTOUR STRIP CROPPING

CONTOUR cultivation is an essential step toward soil and water conservation on nearly all sloping cropland. But, used alone, it seldom offers sufficient protection except on very gentle slopes. Steeper areas usually require supplementary protection in the form of strip cropping or terracing.

Contour strip cropping combines the principle of level cultivation with that of crop rotation. The farmer alternates his clean-tilled and his thick-growing crops in bands across the slope. Water flowing down from the clean-tilled strips is caught, filtered, and absorbed in the bands below. Soil washed down from above is deposited around the roots of the thick-growing plants.

Strip cropping divides the one long slope into a series of shorter ones

Terraces and contour tillage are combined in this cornfield. The white line indicates the terrace section

TERRACING

TERRACING is particularly adapted to long, regular slopes where the topsoil is deep and there is considerable concentration of run-off water. Broad-base terraces form a series of wide, shallow drainageways which carry the excess moisture slowly across the slope and discharge it into a protected outlet leading down the hill. Sturdily built, with properly constructed outlets, terraces are able to handle run-off effectively and safely after even the heaviest rains.

VEGETATED WATERWAYS

AT CERTAIN places on the farm there may be "draws" or natural drainageways which provide a convenient means for disposing of excess rainfall. But these natural drainageways must be carefully protected or gullies will develop. Planting them to an adaptable cover crop will prevent scouring and provide a supplemental source of pasture or forage.

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Natural waterways, may be effectively vegetated against erosion. Hay is harvested from the waterway when the meadows in this strip-cropped field are cut

PERMANENT PASTURES

A GOOD, thick stand of grass is one of the best protections the soil can have. Consequently, the improvement of permanent pastures is highly important in any well-rounded program of erosion control. The value of permanent pasture in providing cheap feed depends on its capacity to carry livestock without depletion of vegetative cover. A complete program of pasture improvement should include the application of fertilizers and lime, controlled grazing, mowing, and contour furrows. Such a program thickens the vegetative cover, thus increasing the carrying capacity of the pasture and providing a heavier, more effective armor of grass for the soil.

Pasture is the ideal use for much sloping land. Treated as a crop, pasture yields an abundance of inexpensive feed and binds the soil against erosion

CONTOUR FURROWS ON PASTURE LAND

THE average permanent pasture has too little vegetative cover to hold the heavy summer rains. Often the precipitation runs off to streams and rivers while the growth thins out for lack of adequate moisture. But once again the principle of the contour may be used to excellent advantage. By plowing furrows on the contour of his sloping pasture land the farmer can conserve the moisture and thicken the cover of grasses or legumes.

CONTROLLED GRAZING

EVERY pasture has a limited range in carrying capacity. As long as the number of head is kept within that established limit the grass will revegetate and provide permanent protection against erosion. Overgrazing results in the gradual depletion of the grass and increased losses of soil and moisture.

Contour furrows catch the escaping rainfall and give it a chance to settle into the soil

GULLY CONTROL

GULLIES are the most advanced form of erosion damage and, when once formed, have a natural tendency to spread and grow. There is no need, however, for these unsightly earth-wounds to constitute either a dead loss to the farmer or a threat to his remaining productive land. Plantings of grasses, vines, and trees will hold the soil. Where necessary, check dams of sod, masonry, or other material thrown across the bed of a gully will prevent further cutting until permanent vegetation becomes established. Gullies may then become a supplementary source of hay crops or of timber products.

Simple woven-wire dams held silt in this gully, allowing black locust and red pine trees to stop active erosion in two growing seasons. At the same time, valuable wood products are in the making

FARM WOODLANDS

ON THE average farm in the Ohio Valley Region there are "problem areas"—pieces of land so steep or severely eroded that they cannot safely be planted to clean-tilled crops or profitably used as pasture. Correct land use requires that such places be planted to adapted trees and carefully managed as permanent woodlands. By correct planting, by protecting his woods against fire and grazing, and by cutting his trees selectively, the farmer can produce wood products that will insure an income for years to come.

Leaf litter produces loamy forest soil. Cover like this defies erosion

The business end of a farm woodland. Lumber, posts, and firewood make proper woodland management a profitable enterprise

EROSION CONTROL AND WILDLIFE CONSERVATION

SMALL eroded areas, gullies, fence rows, odd corners and woodlands have a use which many farmers have been overlooking. Such areas, when properly treated, furnish an almost ideal haven for desirable forms of wildlife. These areas can be made to provide both food and cover for game birds, insect-eating birds, and fur-bearing mammals. Thus, as a byproduct of erosion-control plantings, otherwise unproductive areas on the farm can be made to yield real benefits in the form of game, fur, and a measure of protection against destructive insects and weeds.

A good vegetative growth not only protects the soil but also provides food and nesting cover for the bobwhite and other desirable birds

DOES SOIL CONSERVATION PAY?

THE well-rounded program of soil conservation is one that places no undue financial burden on the farmer. The replanned farm will make a living for the farmer and maintain the soil at the same time. This dual purpose is not impossible. Records show that soil-conservation farms, properly planned to meet both soil and economic needs, yield as good if not a better living than they did under soil-destroying management.

Conservation agriculture considers the future as well as the present. The conservation farmer is keeping a watchful eye on the productivity of his farm for the years that lie ahead. He is striving earnestly to protect his land against further depredations of nature. He hopes to pass on to his son an even better farm than he himself received.

The Soil Conservation Service in Region 3

The Ohio Valley Region includes the States of Michigan, Ohio, Indiana, Kentucky, and Tennessee

Soil Conservation Service projects are located in all five States of Region 3. Civilian Conservation Corps camps are helping farmers control erosion in Ohio, Indiana, Kentucky, and Tennessee. A complete list of SCS demonstration areas and CCC camps appears on the back cover of this bulletin.

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By the early spring of 1938, more than 5,400 farms with a total area of more than 730,000 acres had been replanned for soil and water conservation, following the technical advice provided by the Soil Conservation Service. These replanned farms serve as examples of what farmers can do to conserve soil and water.

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For detailed information concerning soil-conservation farming practices, farmers should see their county agricultural agent or the nearest Soil Conservation Service project or camp officials.

OHIO VALLEY REGION

of the

SOIL CONSERVATION SERVICE

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Demonstration Areas

Name or Location	Headquarters
Leatherwood Creek	Bedford, Ind.
New Castle Area	New Castle, Ind.
Fowler Area	Fowler, Ind.
Massac Creek	Paducah, Ky.
Greasy Creek	Madisonville, Ky.
Grassy Creek	Falmouth, Ky.
Benton Harbor	Benton Harbor, Mich.
Fenton Area	Howell, Mich.
Salt Creek	Zanesville, Ohio
Muddy Fork	Wooster, Ohio
Indian Creek	Hamilton, Ohio
Granny-Dry Creeks	Mt. Vernon, Ohio
Seneca Lake Area	Cambridge, Ohio
Gibson Area	Humboldt, Tenn.
Robertson Area	Springfield, Tenn.

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SCS—CCC Camps

April 1938

Indiana, 8	Ohio, 13
Kentucky, 11	Tennessee, 6

Total, 38

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